

IN THE DRAWINGS:

Cancel the proposed amendment to FIG. 1 in the application.

IN THE CLAIMS:

Cancel claims 35, 41, and 42 without prejudice.

Amend claims 28, 37, 56, 57, and 63 as shown in the marked up and clean copies of these claims in the attached appendix.

Add new claims 66-70.

R E M A R K S

Re-examination and favorable reconsideration in light of the above amendments and the following comments are respectfully requested.

Claims 28, 32, 33, 35-48, 50, and 53-65 are pending in the application. Currently, no claim stands allowed.

By the present amendment, claims 28, 37, 56, 57, and 63 have been amended and claims 35, 41, and 42 have been cancelled.

In the office action mailed June 5, 2001, the Examiner objected to the proposed drawing amendment to Figure 1. By

in the specification and the cited portion. If the Examiner wishes to maintain this rejection, it would greatly help Applicant if the basis for this rejection can be further explained. Applicant believes that the instant application discloses a fully complete device and method which one of ordinary skill in the art would understand as being in the possession of Applicant at the time the application was filed.

Claims 28, 32, 33, 35-48, 50, and 53-65 have been rejected under 35 U.S.C. 112, first paragraph as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains or with which it is mostly nearly connected to make and use the invention. The Examiner contends that Applicant claims an area of at least 90% and that the specification does not enable those in the art to allow for a bottom plate construction which has 100% of its area as orifices.

This rejection is not understood by Applicant. One of ordinary skill in the art would understand that one cannot have a plate that has 100% of its area as orifices. Such a construction would be a hole. Therefore, one of ordinary skill in the art would understand that you cannot have 100% of the plate as an orifice. As to the averment that at

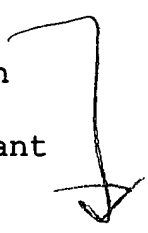
least 90% inherently includes up to 100%, it should be noted that Applicant does not disclose a plate having 100% orifices. To say that such a construction is within the claim language makes no sense to Applicant. The Examiner is hereby requested to withdraw this rejection. With regard to saying that the orifices are located on the corrugations, the independent claims in the application have been amended to do so.

Claims 28, 32, 33, 35-48, 50, and 53-65 have been rejected under 35 U.S.C. 112, second paragraph as being indefinite. By the present amendment, Applicant has amended the claims to overcome the objections raised by the Examiner in this rejection. Therefore, the rejection has been mooted by the present amendment.

Claim 53 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Leva (U.S. Patent No. 3,933,953) in view of McNulty et al. (U.S. Patent No. 5,645,953) in further view of Chuang (U.S. Patent No. 5,387,377) and further in view of Hardwick (Handbook of Brewing, pages 294-299) and further in view of Lee et al. (U.S. Patent No. 5,106,544). A review of the file shows that claim 53 is a dependent claim which depends from claims 28-37. Since the Examiner has not applied the cited and applied references against either claim 28 or claim 37, and since the

limitation of these claims are incorporated into claim 53, the rejection is untenable and fatally defective. The Examiner is hereby requested to withdraw the rejection.

Claims 28, 32, 33, 35-48, 50, and 53-65 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admissions in view of Kruger et al. (U.S. Patent No. 4,550,029) and further in view of Perry's Chemical Engineering Handbook (pages 18-19 to 18-37). In making this rejection, the Examiner contends that Applicant admits the well known processing of beer wort to remove unwanted volatile flavors is known in the art. The Examiner notes however that Applicant does not disclose the specifically claimed apparatus. It is also true that this alleged admission does not disclose the specifically claimed method to be old. In Applicant's opinion, the rejection is fatally defective since the Examiner is relying on the alleged admission on page 1 as the primary element in the rejection and that element has nothing to do with the claimed invention. For this reason alone, the Examiner should remove the rejection.



With respect to Kruger et al., Kruger et al. teaches that an absorption method of eliminating volatile components from a wort (column 2, line 7). Kruger et al. also teach the formation of vapor bubbles which provide an

advantageous movement of the wort (see column 2, lines 6 and 7). In column 3, lines 21-26, Kruger et al. teach that the steam flows intensively through the wort and causes considerable movement of the wort and an intensive formation of vapor bubbles (see also claim 1, column 4, lines 43 and 44 of Kruger et al.). Kruger et al., while disclosing a multistage column device, does not disclose many of the features of the claimed device and method. For example, there is no disclosure of a corrugated bottom plate with at least 90% of its area being orifices, the claimed chimneys, etc.

The Perry citation teaches that packed columns for gas - liquid contacting are used extensively for absorption operation and to a limited extent for distillation. Accordingly, Perry's teachings would dissuade one skilled in the art from using a column such as Kruger et al.'s. Perry notes that the packed columns are usually specified when plate devices would not be feasible. In the same paragraph of Perry, condition 4 favoring packed columns says that liquids tending to form may be handled more readily in packed columns because of the relatively low degree of liquid agitation by the gas. This is in contradiction with the teachings of Kruger et al. which recommend intensive movement of the wort.

- yes  
would  
modify  
Kruger

Among the conditions unfavorable to packed columns, condition 1 says that "if solids are present in the liquid or gas, plate columns can be designed to permit easier cleaning". As wort contains solids in suspension, Perry would dissuade using a packed column for wort treatment. *proof?* Conditions 3, 5, and 6 in Perry teach away from using a *really?* packed column for elimination of undesired volatile components from hot beer wort. Clearly, it can be seen that one of ordinary skill in the art would not be inclined to combine Kruger et al. and Perry as suggested by the Examiner. Perry does not overcome the deficiencies of Kruger et al. with respect to the claimed device limitations and the claimed method steps.

Further, the Examiner has not pointed out specifically in the rejection where one of ordinary skill in the art can find all the claimed components of the device set forth in claims 28, 32, 33, 36-48, 50, and 53-62 in Perry and/or Kruger et al. Further, the Examiner has not pointed out *which ones?* where each of the method steps in claims 63-65 can be found in the cited and applied references. It is submitted that neither Perry nor Kruger et al. teaches or suggests all of the elements of the claims pending in the instant application. For this reason alone, all of the claims are clearly allowable over these cited and applied references.

Further, with regard to claim 63, it is submitted that neither Kruger et al. nor Perry teaches or suggests the method steps. Kruger et al. recommends intensive movement of the wort caused by intensive vapor bubbling. In contrast to this, the method of claim 63 calls for separating liquid and gas at the level of the upper distribution plate, and distributing uniformly over all of the cross section of the column the liquid in the upper part of the column and the steam or gas in the lower part of the column provides a minimum movement of the wort and, at the same time, unexpectedly and surprisingly, an excellent efficiency of desorption of DMS and other undesired volatile components. Additional features set forth in the claims also decrease movement of the wort, for example the choice of relatively large size filler bodies with a low surface area by volume ratio. As previously mentioned, Perry is contrary to Kruger et al.'s teaching and is of a nature which would dissuade one skilled in the art to consider the method for claim 63 and/or the device of claims 28 or 57 for treating hot beer wort. If the Examiner is to continue the maintenance of this rejection, he is hereby requested to specifically point out where each of the limitation of each of the claims pending in the application can be found in Perry and/or Kruger et al.

With respect to new claims 66-70, these claims are believed to be allowable for the same reasons that claim 63 is allowable as well as on their own accord. The instant application is now believed to be in condition for allowance. Such allowance is respectfully solicited.

Should the Examiner believe an additional amendment is needed to place the case in condition for allowance, he is hereby invited to contact Applicant's attorney at the telephone number listed below.

Enclosed herewith is a three (3) month Extension of Time Request. A check in the amount of \$956.00 is enclosed herewith to cover the fee for the additional claims and the Extension of Time fee. Should the Commissioner determine that an additional fee is due, he is hereby authorized to charge said fee to Deposit Account No. 02-0184.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231

on December 4, 2001

(Date of Deposit)

Nicole Motzer

Name and Reg. No. of Attorney

*Nicole Motzer*

Signature

December 4, 2001

Date of Signature

Respectfully submitted,

DIRK SELDESLACHTS

By *Barry L. Kelmachter*

Barry L. Kelmachter  
Attorney for Applicant

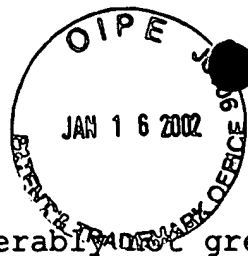
Area Code: 203

Telephone: 777-6628 ext. 114

Telefax: 865-0297

Date: December 4, 2001





the invention.

The above distances are preferably not greater than approximately 0.5 m.

In a preferred embodiment of the present invention means are provided for cleaning the interior of the column after a plurality of treatment cycles, without demounting the column. The device of the invention has numerous inlets and outlets and cleaning merely by introducing a cleaning liquid into the device so that it follows the normal path of the wort is not always sufficient. Additional cleaning means are therefore provided.

The additional cleaning means advantageously comprise one or more distributors [26] of washing or rinsing liquid located in various regions of the column.

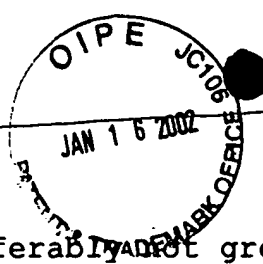
Distributors [26] of this kind may be provided at the level of the wort distribution means, at the level of the means for increasing the surface area of contact of the wort with a current of inert gas or steam, at the level of the means of distribution of the current of inert gas or steam, at the level of the means for recovering the treated wort, for example.

The distributors [26] are, for example, products known as "cleaning balls [26]" enabling a particular area to be covered with a washing or rinsing liquid, for example water or soda solution, fed in through a pipe.

The cleaning balls [26] usable in the context of the present invention are, for example, the "spray cleaning devices" sold by the German company Tuchenhausen.

The distributors [26] are advantageously connected to external command and control systems known in themselves.

The various components of the device of the present invention and the operations that they perform are advantageously commanded, regulated and controlled by a system that is preferably an external system.



the invention.

The above distances are preferably not greater than approximately 0.5 m.

In a preferred embodiment of the present invention means are provided for cleaning the interior of the column after a plurality of treatment cycles, without demounting the column. The device of the invention has numerous inlets and outlets and cleaning merely by introducing a cleaning liquid into the device so that it follows the normal path of the wort is not always sufficient. Additional cleaning means are therefore provided.

DI The additional cleaning means advantageously comprise one or more distributors of washing or rinsing liquid located in various regions of the column.

Distributors of this kind may be provided at the level of the wort distribution means, at the level of the means for increasing the surface area of contact of the wort with a current of inert gas or steam, at the level of the means of distribution of the current of inert gas or steam, at the level of the means for recovering the treated wort, for example.

The distributors are, for example, products known as "cleaning balls" enabling a particular area to be covered with a washing or rinsing liquid, for example water or soda solution, fed in through a pipe.

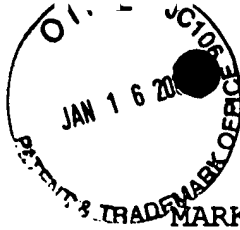
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The cleaning balls usable in the context of the present invention are, for example, the "spray cleaning devices" sold by the German company Tuchenhausen.

The distributors are advantageously connected to external command and control systems known in themselves.

02 The various components of the device of the present invention and the operations that they perform are advantageously commanded, regulated and controlled by a system that is preferably an external system.

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USSN 09/051,565

MARKED UP COPY OF AMENDED CLAIMS

28. (Twice Amended) Device for eliminating unwanted volatile components from beer wort comprising:

a counter-current contact column for contact between an ascending current of steam or inert gas and a descending current of wort at a temperature substantially equal to the boiling point of said wort at [the] a pressure in the column;

said column containing filler bodies to increase the surface area of contact within the column between the wort and the current of steam or inert gas;

means for feeding and uniformly distributing the beer wort into said column, said feeding and uniformly distributing means being located in a top part of the column and comprising a distribution plate perpendicular to a longitudinal axis of the column, said distribution plate being disposed under a wort feed into said column at the level of the top part of said column, said distribution plate including first means for uniform flow of the wort in the descending direction and second means for flow of said current of inert gas or steam in the ascending direction;

said first means for uniform flow of said wort comprising a plurality of orifices in said distribution plate and the second means for flow of said current of inert gas or steam comprising a plurality of chimneys on a surface of said distribution plate;

*Process 558 324  
1/16/40*  
said plurality of orifices in said distribution plate being sufficient in number and diameter to allow a predetermined flow rate of said wort, to provide a depth of said wort on top of said plate, and to prevent the passage of steam or inert gas through said orifices [and thereby substantially prevent foaming of the wort at the level of the top part of the column];

means for feeding and uniformly distributing the current of steam or inert gas inside the column, said means for feeding and uniformly distributing the current of steam or inert gas inside the column being located in a bottom part of the column and comprising a bottom plate arranged [substantially] perpendicular to the longitudinal axis of the column: and

said bottom plate comprising a corrugated plate having a corrugated surface, said bottom plate having means for increasing the surface area of contact, said means for increasing the surface area of contact comprising [a number of]

orifices [in said] over all of said corrugated surface of said bottom plate such that a total surface area through which said current of inert gas or steam passes upwardly and said current of wort passes downwardly is equal to at least 90% of a transverse surface area of the column[so as to substantially prevent foaming of the wort at the level of said bottom plate].

37. (Twice Amended) Device according to claim 28, wherein the means for uniform distribution of a current of inert gas or steam comprises a main pipe disposed at a level of a region from which the treated wort is extracted, in the bottom part of the column, and having a plurality of orifices, said orifices being regularly arranged on the greater part of the main pipe so that the current of inert gas or [stream] steam can be fed into the interior of the column over [substantially] all of the cross-section of said column.

56. (Amended) Device according to claim 28, wherein said filler bodies are piled up directly above said bottom plate in the volume between said bottom plate and said distribution plate[, said volume being free from any rack].

57. (Amended) A device for eliminating unwanted volatile components from beer wort, said device comprising:

a counter-current contact column;

means for creating a descending column current of wort within said column;

means for creating an ascending column current of inert gas or steam within said column;

said wort descending column current creating means comprising means for feeding and uniformly distributing the beer wort into said column positioned in a top part of said column, said beer wort feeding and uniformly distributing means comprising a distribution plate disposed under a wort feed into the column;

said distribution plate including first means for uniform flow of the wort in the descending direction and second means for flow of said current of inert gas or steam in the ascending direction;

said means for creating an ascending column of inert gas or steam comprising means for feeding and uniformly distributing



the current of inert gas or steam in a bottom part of the column;

said means for feeding and uniformly distributing the current of inert gas comprising a bottom plate having orifices through which the steam or the inert gas pass upwardly;

said bottom plate is a corrugated plate having a corrugated surface and said orifices are over all of said corrugated surface;

means for collecting the wort after said wort completes its descent, said collecting means being located beneath said bottom plate at a distance thereof such as to prevent formation of foam and including means for avoiding any [significant] formation of foam; and

means for extracting the collected wort for transmission to at least one of a cooling tank and a fermentation tank.

63. (Amended) A method of eliminating unwanted volatile components from a beer wort in a column by counter current contact between a descending current of heated wort and an

ascending current of heated steam or inert gas at a predetermined internal pressure in said column, comprising:

heating said wort at a temperature substantially equal to the boiling point of said wort at said internal pressure;

separating unwanted volatile components from said wort, said separating step comprising providing a column having a distribution plate at the level of a top part of said column and a bottom plate at the level of a bottom part of said column, which bottom plate is a corrugated bottom plate having a corrugated surface and has orifices over all of said corrugated surface, said orifices providing a free surface area of at least 90% of the cross sectional area of the column;

providing said distribution plate with a plurality of orifices in said distribution plate for uniform flow of said wort in said column, and providing a plurality of chimneys on a top surface of said distribution plate for uniform flow of steam or inert gas in said column;

said separating step further comprising introducing said heated wort into said column above said distribution plate and

feeding and uniformly distributing said current of inert gas or steam in a bottom part of said column below said bottom plate;

passing said wort through said orifices in said distribution plate in a descending direction and at a flow rate which allows a volume of wort to build up on said top surface of said distribution plate, while allowing said steam or inert gas to separately ascend through said chimneys of said distribution plate so as to reduce contact between the wort and the inert gas or steam[, and while avoiding any significant formation of foam at the level of the top part of the column];

creating an ascending current of said inert gas or steam at a temperature substantially equal to that of said heated wort inside the column beneath said bottom plate; and

placing said descending wort flow in contact with said ascending current of said inert gas or steam so as to eliminate said unwanted volatile compounds by flowing said wort through filler bodies directly supported by said bottom plate [while avoiding any significant formation of foam at level of said bottom part of said column and at the level of said filler bodies];

collecting the wort below said bottom plate after said wort  
has completed said descent; and

extracting the collected wort.



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CLEAN COPY OF AMENDED CLAIMS

28. (Twice Amended) Device for eliminating unwanted volatile components from beer wort comprising:

a counter-current contact column for contact between an ascending current of steam or inert gas and a descending current of wort at a temperature substantially equal to the boiling point of said wort at a pressure in the column;

03 said column containing filler bodies to increase the surface area of contact within the column between the wort and the current of steam or inert gas;

means for feeding and uniformly distributing the beer wort into said column, said feeding and uniformly distributing means being located in a top part of the column and comprising a distribution plate perpendicular to a longitudinal axis of the column, said distribution plate being disposed under a wort feed into said column at the level of the top part of said column, said distribution plate including first means for uniform flow of the wort in the descending direction and second means for flow of said current of inert gas or steam in the ascending direction;

said first means for uniform flow of said wort comprising a plurality of orifices in said distribution plate and the second means for flow of said current of inert gas or steam comprising a plurality of chimneys on a surface of said distribution plate;

said plurality of orifices in said distribution plate being sufficient in number and diameter to allow a predetermined flow rate of said wort, to provide a depth of said wort on top of said plate, and to prevent the passage of steam or inert gas through said orifices;

D3  
means for feeding and uniformly distributing the current of steam or inert gas inside the column, said means for feeding and uniformly distributing the current of steam or inert gas inside the column being located in a bottom part of the column and comprising a bottom plate arranged perpendicular to the longitudinal axis of the column: and

said bottom plate comprising a corrugated plate having a corrugated surface, said bottom plate having means for increasing the surface area of contact, said means for increasing the surface area of contact comprising orifices over all of said corrugated surface of said bottom plate such that a

D3 total surface area through which said current of inert gas or steam passes upwardly and said current of wort passes downwardly is equal to at least 90% of a transverse surface area of the column.

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D4 37. (Twice Amended) Device according to claim 28, wherein the means for uniform distribution of a current of inert gas or steam comprises a main pipe disposed at a level of a region from which the treated wort is extracted, in the bottom part of the column, and having a plurality of orifices, said orifices being regularly arranged on the greater part of the main pipe so that the current of inert gas or steam can be fed into the interior of the column over all of the cross-section of said column.

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56. (Amended) Device according to claim 28, wherein said filler bodies are piled up directly above said bottom plate in the volume between said bottom plate and said distribution plate.

D5 57. (Amended) A device for eliminating unwanted volatile components from beer wort, said device comprising:

a counter-current contact column;

means for creating a descending column current of wort within said column;

means for creating an ascending column current of inert gas or steam within said column;

DS  
said wort descending column current creating means comprising means for feeding and uniformly distributing the beer wort into said column positioned in a top part of said column, said beer wort feeding and uniformly distributing means comprising a distribution plate disposed under a wort feed into the column;

said distribution plate including first means for uniform flow of the wort in the descending direction and second means for flow of said current of inert gas or steam in the ascending direction;

said means for creating an ascending column of inert gas or steam comprising means for feeding and uniformly distributing the current of inert gas or steam in a bottom part of the column;



said means for feeding and uniformly distributing the current of inert gas comprising a bottom plate having orifices through which the steam or the inert gas pass upwardly;

said bottom plate is a corrugated plate having a corrugated surface and said orifices are over all of said corrugated surface;

D5 means for collecting the wort after said wort completes its descent, said collecting means being located beneath said bottom plate at a distance thereof such as to prevent formation of foam and including means for avoiding any formation of foam; and

means for extracting the collected wort for transmission to at least one of a cooling tank and a fermentation tank.

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63. (Amended) A method of eliminating unwanted volatile components from a beer wort in a column by counter current contact between a descending current of heated wort and an ascending current of heated steam or inert gas at a predetermined internal pressure in said column, comprising:

D6 heating said wort at a temperature substantially equal to the boiling point of said wort at said internal pressure;

separating unwanted volatile components from said wort, said separating step comprising providing a column having a distribution plate at the level of a top part of said column and a bottom plate at the level of a bottom part of said column, which bottom plate is a corrugated bottom plate having a corrugated surface and has orifices over all of said corrugated surface, said orifices providing a free surface area of at least 90% of the cross sectional area of the column;

Db providing said distribution plate with a plurality of orifices in said distribution plate for uniform flow of said wort in said column, and providing a plurality of chimneys on a top surface of said distribution plate for uniform flow of steam or inert gas in said column;

said separating step further comprising introducing said heated wort into said column above said distribution plate and feeding and uniformly distributing said current of inert gas or steam in a bottom part of said column below said bottom plate;

passing said wort through said orifices in said distribution plate in a descending direction and at a flow rate which allows a volume of wort to build up on said top surface of

said distribution plate, while allowing said steam or inert gas to separately ascend through said chimneys of said distribution plate so as to reduce contact between the wort and the inert gas or steam;

creating an ascending current of said inert gas or steam at a temperature substantially equal to that of said heated wort inside the column beneath said bottom plate; and

Db placing said descending wort flow in contact with said ascending current of said inert gas or steam so as to eliminate said unwanted volatile compounds by flowing said wort through filler bodies directly supported by said bottom plate;

collecting the wort below said bottom plate after said wort has completed said descent; and

extracting the collected wort.

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NEW CLAIMS 66-70

66. A method according to claim 63, further comprising:

providing at least one inclined surface directed towards the bottom of the column with said at least one surface having means forming a baffle in a bottom part of the column; and

flowing said wort over said at least one inclined surface.

D7  
67. A method according to claim 63, wherein said step of providing said distribution plate comprises providing a distribution plate with a metal base, wherein said step of providing said distribution plate with a plurality of orifices comprises providing a plurality of orifices in said metal base sufficient in number and dimensioned to create a particular wort flow rate and to provide a volume of wort on top of said metal base, and wherein said chimney providing step comprises providing chimneys having a height which prevents the volume of wort remaining on top of said base from passing through said chimneys.

68. A method according to claim 63, wherein the flow rate of said inert gas or steam is from about 0.5% to about 3.0% by weight of the flow rate of the wort.

D7 69. A method according to claim 63, further comprising using a filler body having a low exchange surface area per unit volume to reduce wort/steam exchanges.

70. A method according to claim 67, wherein said filler body using step comprises using rings having a diameter of at least 3 to 4 cm.

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